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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| EXAMINER |
|---|
| KALLIS, RUSSELL |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1638 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/763,005 | KIRBY ET AL. | |
| | Examiner | Art Unit | |
| | Russell Kallis | 1638 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *14 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,2,7-12,16-18,20-22,29 and 30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,7-12,16-18,20-22,29 and 30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a)☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: .

## DETAILED ACTION

The objection to Claim 19 has been withdrawn in view of Applicant's cancellation of the claim.

The rejection of claims 1-40 under 35 U.S.C. 112, first paragraph, written description, is withdrawn in view of the teachings of the Canton reference.

The rejection of claims 1-40 under 35 U.S.C. 112, first paragraph, scope of enablement, is withdrawn in view of Applicant's amendments.

The rejection of claims 12-27, 31, and 40 under 35 U.S.C. 112, second paragraph, is withdrawn in view of Applicant's amendments.

The rejection of claims 21, 22, 31, and 40 under 35 U.S.C. 101 is withdrawn in view of Applicant's amendments.

The rejection of claims 1-11 and 20-22 under 35 U.S.C. 103(a) as being unpatentable over van Engelen *et al.* (Transgenic Research 4, pp. 288-290, 1995) in view of Canton *et al.* (Plant Molecular Biology 22, pp. 819-828, 1993) is withdrawn in view of the new prior art rejections set forth below.

The rejection of claims 12-40 under 35 U.S.C. 103(a) as being unpatentable over Donn *et al.* (EP0303780 1989-02-22) in view of Feuiller *et al.* (Plant Molecular Biology 27, pp. 651-667, 1995) is withdrawn in view of the new prior art rejections set forth below.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 3-6, 13-15, 19, 23-28, 31-40 have been cancelled. Claims 1, 2, 7-12, 16-18, 20-22, 29 and 30 are pending.

***Claim Rejections - 35 USC § 112***

Claims 17 and 30 remain rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. This rejection is maintained for the reasons of record set forth in the Official actions mailed 7/08/2002. Applicants arguments filed 1/14/2003 have been considered but are not deemed persuasive.

Applicant asserts that the INRA clone is used by other scientists and cites publications to that effect (response pages 14-15). There is nothing to indicate that the INRA clones cited in the references are readily available to the public, and that no restrictions will be imposed.

Claims 2, 7-12, 16-18, 20-22 and 29-30 remain rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection is maintained for the reasons of record set forth in the Official actions mailed 7/08/2002. Applicants arguments filed 1/14/2003 have been considered but are not deemed persuasive.

At Claim 2, lines 3-4 and Claim 7, lines 5, 7, 9, and 10, the term Genbank Accession No. X69822 is indefinite because Genbank sequences can be updated. Thus it is not clear what sequence is intended. Applicant asserts that the sequence is the sequence taught in the Canton reference (response page 17). Applicant's attention is directed to MPEP 1.821(a-h) where the requirements for a sequence listing of the sequences that are disclosed in the application are set forth as well as the use of sequence identifiers when referring to a specific sequence in the claims. Appropriate action is required.

At Claim 7, lines 7-8, "a protein that is at least 70% similar to Genbank Accession number X69822" is incorrect. The Genbank Accession number X69822 is a nucleotide sequence. The correct amino acid Genbank number corresponding to the glutamine synthetase cDNA sequence from *Pinus sylvestris* is CAA49476.

At Claim 7, lines 5-6, 9 and 14-15, 'encodes a protein having enzymatic function' is indefinite. It is unclear whether the undefined polynucleotide would encode the activity of a glutamine synthetase or the activity of some other enzyme.

At Claim 11, "the" should be --a--. Applicant has not responded to this rejection.

Claim 12 recites the limitation "said plant" in line 2. There is insufficient antecedent basis for this limitation in the claim. The claim suggests transforming an already transformed plant. Applicant asserts that there is antecedent basis for said plant (response page 18). Applicant's arguments are considered non-responsive because the previously recited plant is a transformed plant whereas the expression cassette is introduced into an untransformed plant. It is recommended that "said plant" be changed to --a plant--.

Claims 18 and 19 are improperly dependent. Applicant asserts that the Examiner's suggestion has been adopted (response page 18). However, the suggestion has not been adopted. The claim remains indefinite because it is unclear if an additional method step is intended or the existing method step is further limited. Amendment of the Claim to recite --wherein the transforming is by *Agrobacterium tumefaciens* mediated transformation-- would obviate the rejection.

At Claim 21, line 1, "A reproductive unit" is indefinite because it is not clear, whether it refers to a seed, a flower or a sexual gameteophyte. Applicant asserts that a reproductive unit can

refer to any of the above mentioned units. Further, Applicant asserts that the term 'reproductive unit' broadly encompasses any unit that facilitates reproduction (response page 19). Applicant's arguments are not persuasive because 'reproductive unit' is not clearly defined in the art or in the specification. Hence, the metes and bounds of the claims are unclear.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Coruzzi *et al.* (U.S. Patent 5,955,651 with an effective filing date of June 7, 1995).

Applicant claims a plant expression cassette comprising a nucleic acid encoding a glutamine synthetase that has 70% identical to Genbank Accession No. X69822 or that encodes a protein with at least 70% similarity to Genbank Accession No. X69822 (the protein encoded thereby) or a nucleic acid sequence that hybridizes to Genbank Accession No. X69822, wherein said nucleic acid is operably linked to a 35S promoter and nos terminator wherein expression in a plant increases nitrogen metabolism.

Coruzzi teaches plant expression cassettes Z3 and Z17 comprising the pBIN vector with a 35S promoter operably linked to a pea glutamine synthetase cDNA having at least 70% sequence identity for both protein and nucleic acid to X69822 (see attached blast results), and a nos terminator (column 21, line 65 to column 22, line 56). Hence, the reference teaches all of the limitations of Claims 1 and 7.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coruzzi *et al.* (U.S. Patent 5,955,651 with an effective filing date of June 7, 1995), in view of each of (Canton F. *et al.* Plant Molecular Biology, 1993 Vol. 22, pp. 819-828) and Applicant's admission.

The claimed invention is discussed supra. Applicant further claims said expression cassette wherein the coding sequence is the *Pinus sylvestris* coding sequence of GenBank Accession number X69822, and Applicant claims *Agrobacterium* and pBIN19 vectors comprising said expression cassette, as well as said vectors that further comprise the neomycin phosphatase II coding DNA.

The teachings of Coruzzi are discussed supra. Coruzzi also teaches *Agrobacterium* vectors (col. 16-17), and Coruzzi teaches inclusion of DNAs that ~~counter~~ antibiotic resistance, including Kanamycin resistance (column 16, lines 16-23).

Coruzzi does not teach a cDNA encoding a glutamine synthetase from *Pinus sylvestris* having Genbank Accession number No. X69882, ~~*Agrobacterium* or~~ pBIN19 vectors, or the neomycin phosphotransferase II DNA that confers Kanamycin resistance.

Canto teaches a full length cDNA clone encoding glutamine synthetase from *Pinus sylvestris* having Genbank Accession number No. X69882, see Abstract.

Applicant admits that pBIN19 was well known in the art (specification, page 19, lines 21-23). Applicant also admits that the neomycin phosphotransferase II DNA for Kanamycin resistance was well known in the art (specification page 19, lines 31-34).

It would have been *prima facie* obvious at the time of Applicant's invention to modify the expression cassette and *Agrobacterium* vector of Coruzzi to substitute the cDNA encoding glutamine synthetase from *Pinus sylvestris* as taught by Canton for the nucleic acid from pea because the two nucleic acids are functional equivalents in that they both encode glutamine synthetase. It would have been obvious to substitute one functional equivalent for another. One would have been motivated by the teaching of Coruzzi that the plant expression cassette was generally useful for increasing nitrogen metabolism in any plant. One would have had a reasonable expectation of success of using the plant expression cassette in transformation of plants in view of the success of Coruzzi. It further would have been obvious to modify the invention of Coruzzi to utilize the pBIN19 vector or to include the neomycin phosphotransferase II coding DNA, as both were well known in the art, and the different vectors and selectable marker genes are considered to be an experimental design choice in the absence of evidence of criticality.

All claims are rejected.

Claims 12, 16-18, 20-22, 29 and 30 are deemed free of the prior art, given the failure of the prior art to teach or reasonably suggest methods of transforming poplar and transformed poplar plants comprising isolated cDNA from *Pinus sylvestris* encoding a glutamine synthetase of GenBank Accession number X69822, wherein said poplar plants have increased growth.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Kallis whose telephone number is (703) 305-5417. The examiner can normally be reached on Monday-Friday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson can be reached on (703) 306-3218. The fax phone numbers for the Group is (703) 308-4242 or (703) 305-3014.

Any inquiry of a general nature or relating to the status of this application or proceeding, or if the examiner cannot be reached as indicated above, should be directed to the receptionist, whose telephone number is (703) 308-0196.

Russell Kallis Ph.D.
March 27, 2003

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